What is claimed:

1. A membrane electrode unit for electrochemical equipment, containing an ionically conductive membrane with a front and back side, a first catalyst layer and a first gas distributor substrate on the front side and a second catalyst layer and a second gas distributor substrate on the back side, in which the first gas distributor substrate has lesser surface dimensions than the ionically conductive membrane and the second gas distributor substrate has essentially the same surface dimensions as the ionically conductive membrane .

2. A membrane electrode unit according to claim 1, wherein the catalyst layer on the front side and the catalyst layer on the back side of the ionically conductive membrane have different surface dimensions.

3. A membrane electrode unit according to claim 1, wherein the catalyst layer on the front side and the catalyst layer on the back side of the ionically conductive membrane have the same surface dimensions.

4. A membrane electrode unit according to claim 1, wherein the ionically conductive membrane on the front side has a surface that is not supported by a gas distributor substrate.

5. A membrane electrode unit according to claim 1, wherein the catalyst layers on the front side and on the back side contain catalysts containing noble metals and optionally ionically conductive materials.

6. A membrane electrode unit according to claim 1, wherein the ionically conductive membrane comprises organic polymers, such as proton-conducting perfluorinated polymeric sulfonic acid compounds, doped polybenzimidazoles, polyether ketones, polysulfones or ionically conducting ceramic materials, and has a thickness of 10 to 200 μm.

7. A membrane electrode unit according to claim 1, wherein the gas distributor substrate comprises porous electrically conductive materials containing carbon fiber paper, carbon fiber nonwoven cloth, carbon fiber cloth, metal mesh, metallized fiber cloth, or combination thereof.

8. A membrane electrode unit according to claim 1, wherein the edge of the gas distributor substrate and the free surface of the ionically conductive membrane not supported by a gas distributor substrate are surrounded by a sealing material.

9. A membrane electrode unit according to claim 8, wherein the sealing material additionally impregnates an edge region of the gas distributor substrates to a depth of at least 1 mm.

10. A membrane electrode unit according to claim 8, wherein the sealing material contains thermoplastic polymers of polyethylene, polypropylene, polytetrafluoroethylene, PVDF, EPDM, polyester, polyamide, polyamide elastomers, polyimide, polyurethane, silicone, silicone elastomers, or combinations thereof and/or thermosetting polymers of epoxides, cyanoacrylates or combinations thereof.

11. A membrane electrode unit according to claim 8, wherein the sealing material is integrally combined with another peripheral plastic frame.

12. A process for producing a membrane electrode unit according to claim 1, comprising combining two catalyst-coated gas distributor substrates with the front and back sides of an ionically conductive membrane.

13. A process for producing a membrane electrode unit according to claim 1, comprising combining two gas distributor substrates which are not catalyst-coated

with the front and back sides of an ionically conductive membrane coated with catalyst on both sides.

14. A process for producing a membrane electrode unit according to claim 8, wherein the surface of the ionically conductive membrane not supported by a gas distributor substrate is brought directly into contact with sealing material.

15. A process for producing a membrane electrode unit according to claim 14, wherein the sealing material is cured by elevated pressure and elevated temperature or by contact with air moisture and/or elevated temperature.

16. Use of the membrane electrode units according claim 1 to produce cell stacks for electrochemical equipment.

17. Use of the membrane electrode units according to claim 1 to produce a fuel cell.